

# SKM 300GA123D



SEMITRANS™ 4

## IGBT Modules

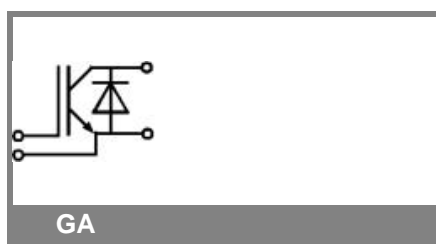
### SKM 300GA123D

#### Features

- MOS input (voltage controlled)
- N channel, Homogeneous Si
- Low inductance case
- Very low tail current with low temperature dependence
- High short circuit capability, self limiting to  $6 \times I_{Cnom}$
- Latch-up free
- Fast & soft inverse CAL diodes
- Isolated copper baseplate using DCB Direct Copper Bonding Technology
- Large clearance (12 mm) and creepage distances (20 mm)

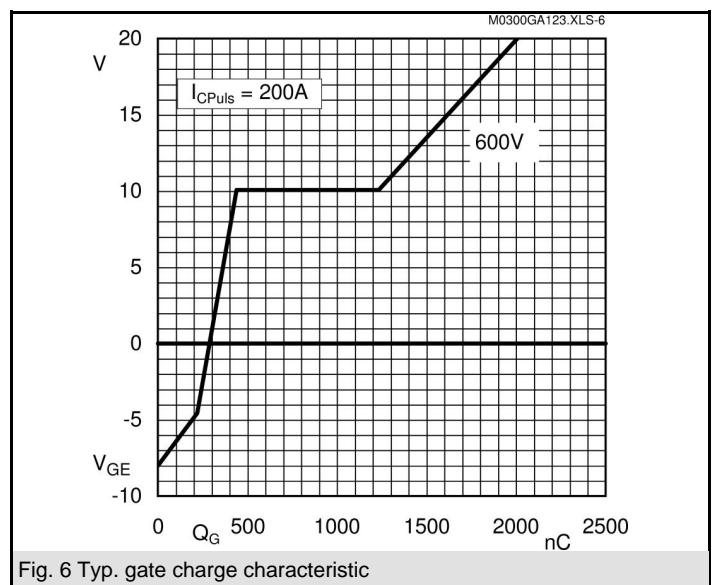
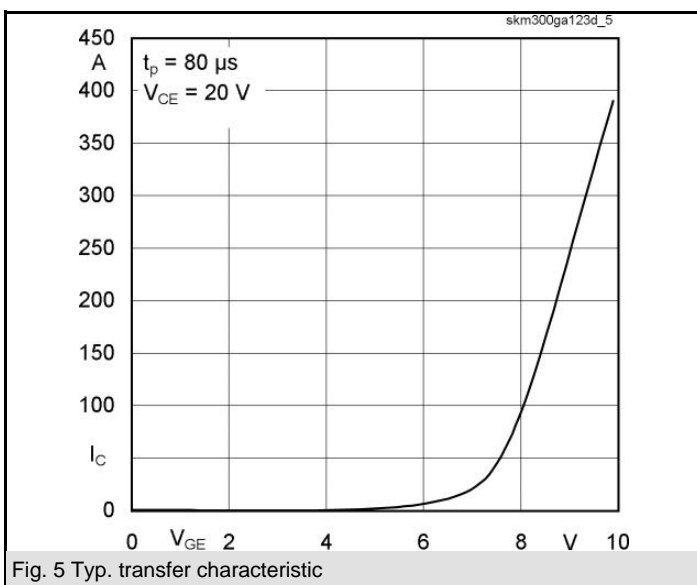
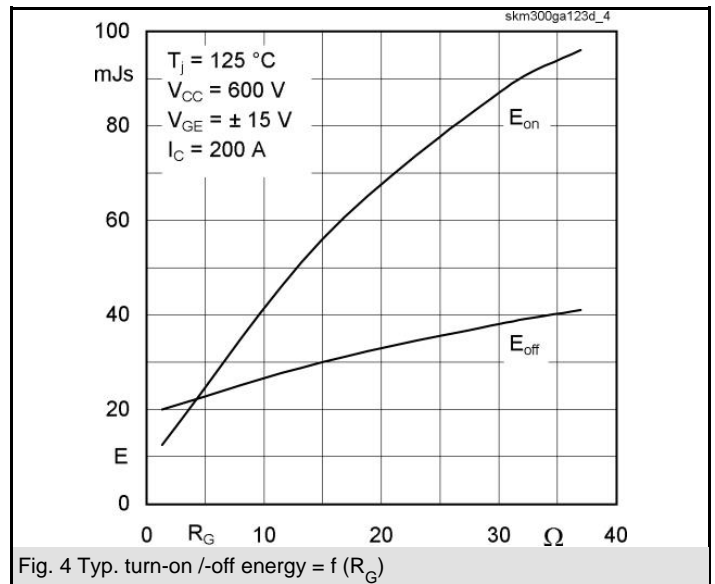
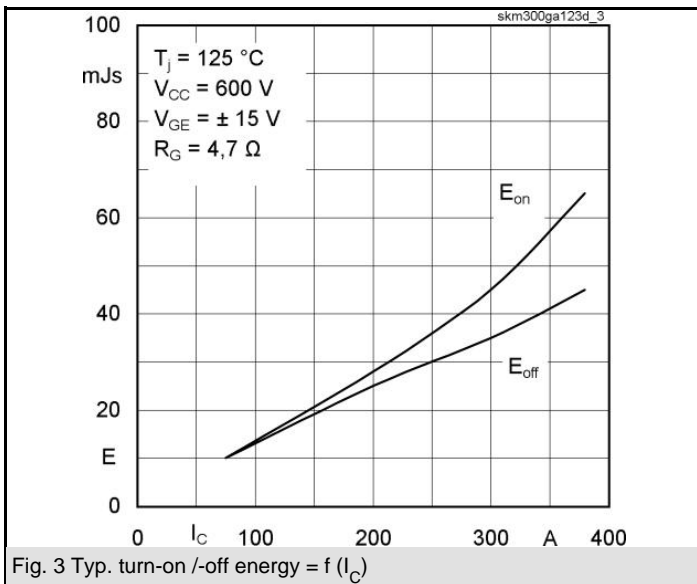
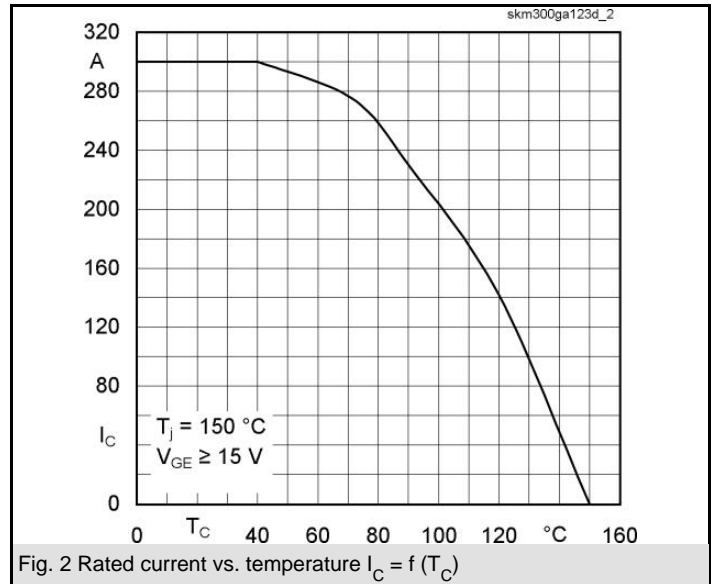
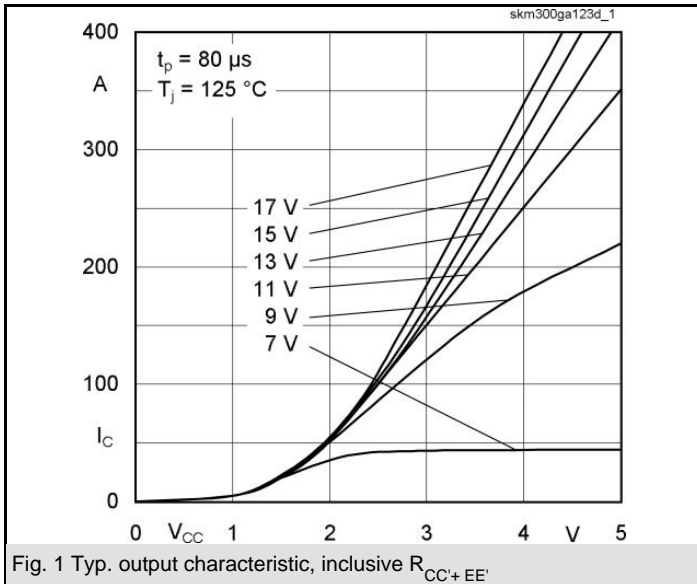
#### Typical Applications

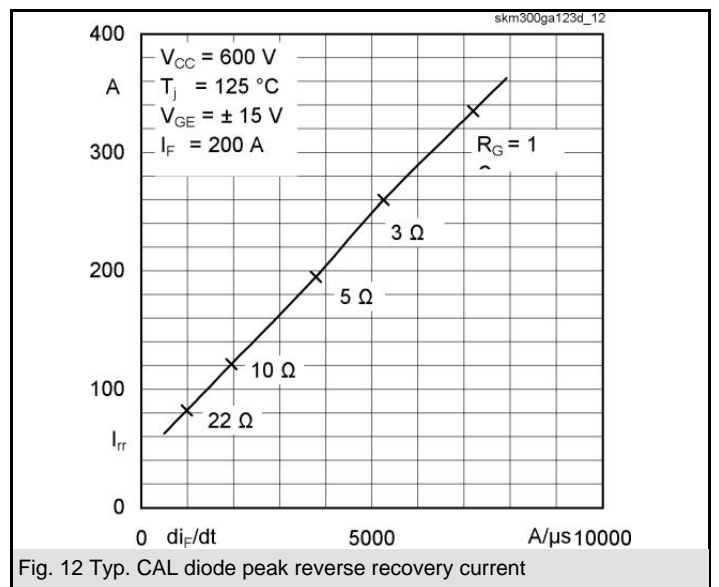
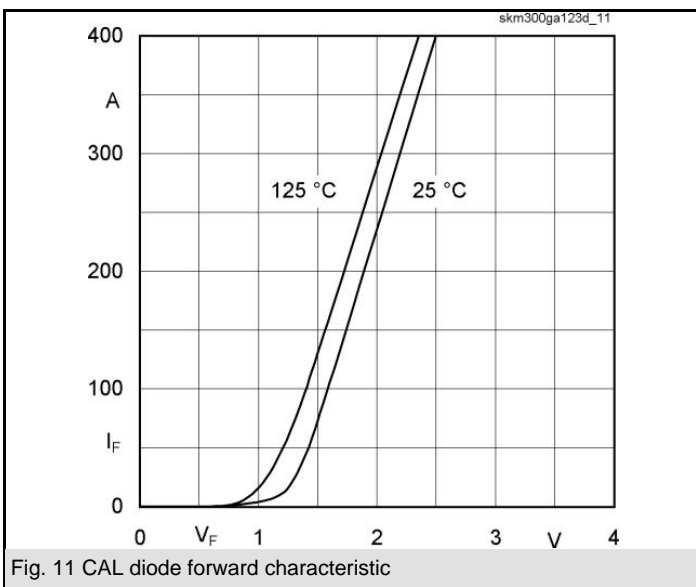
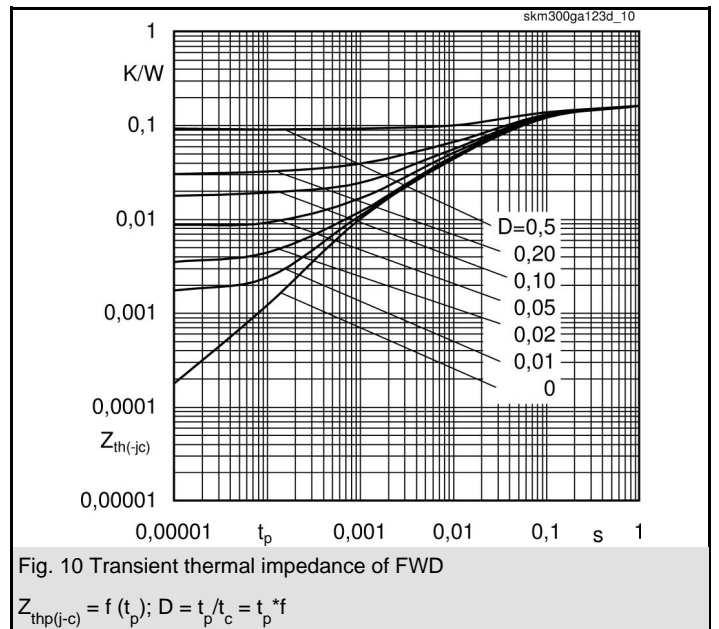
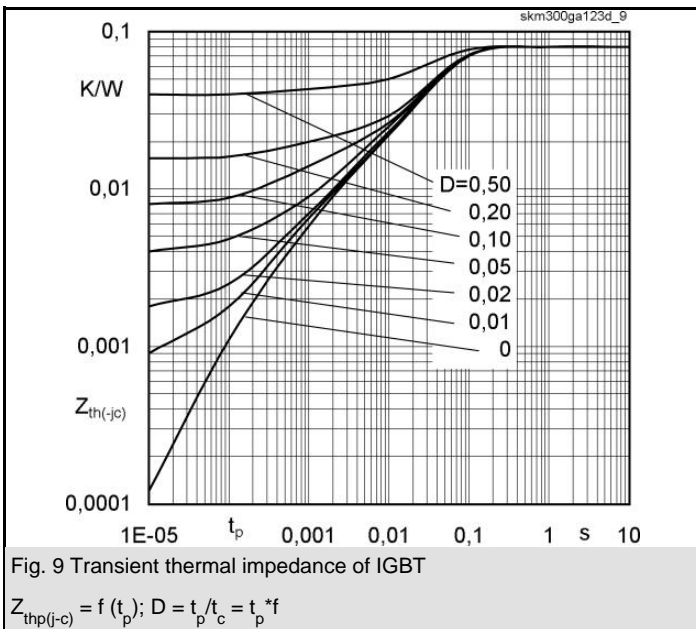
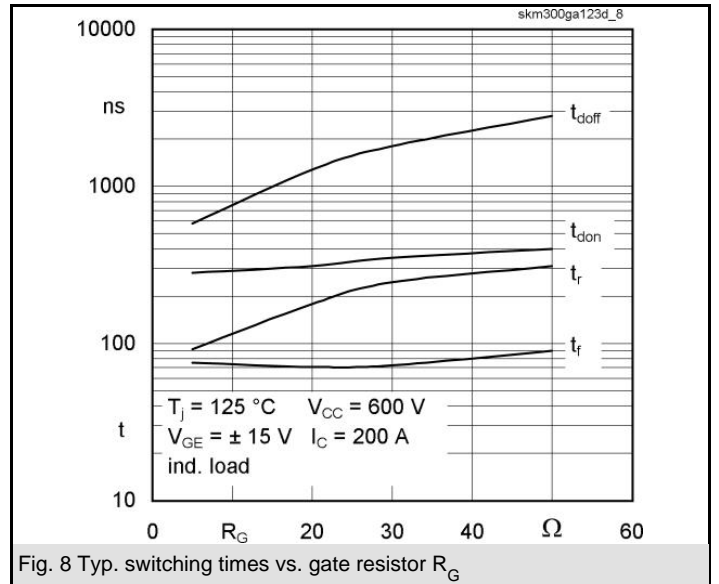
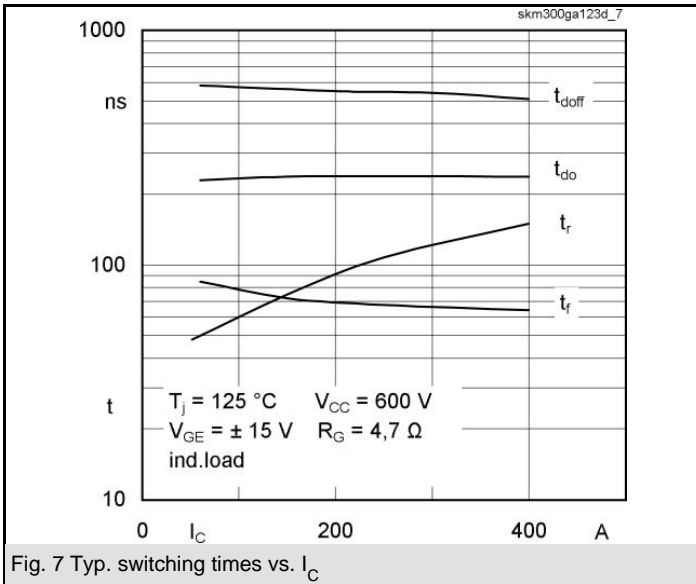
- Switching (not for linear use)



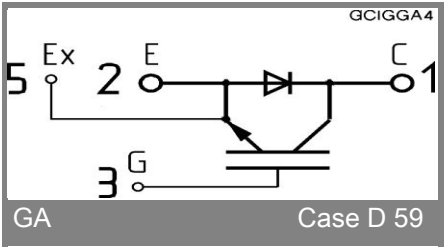
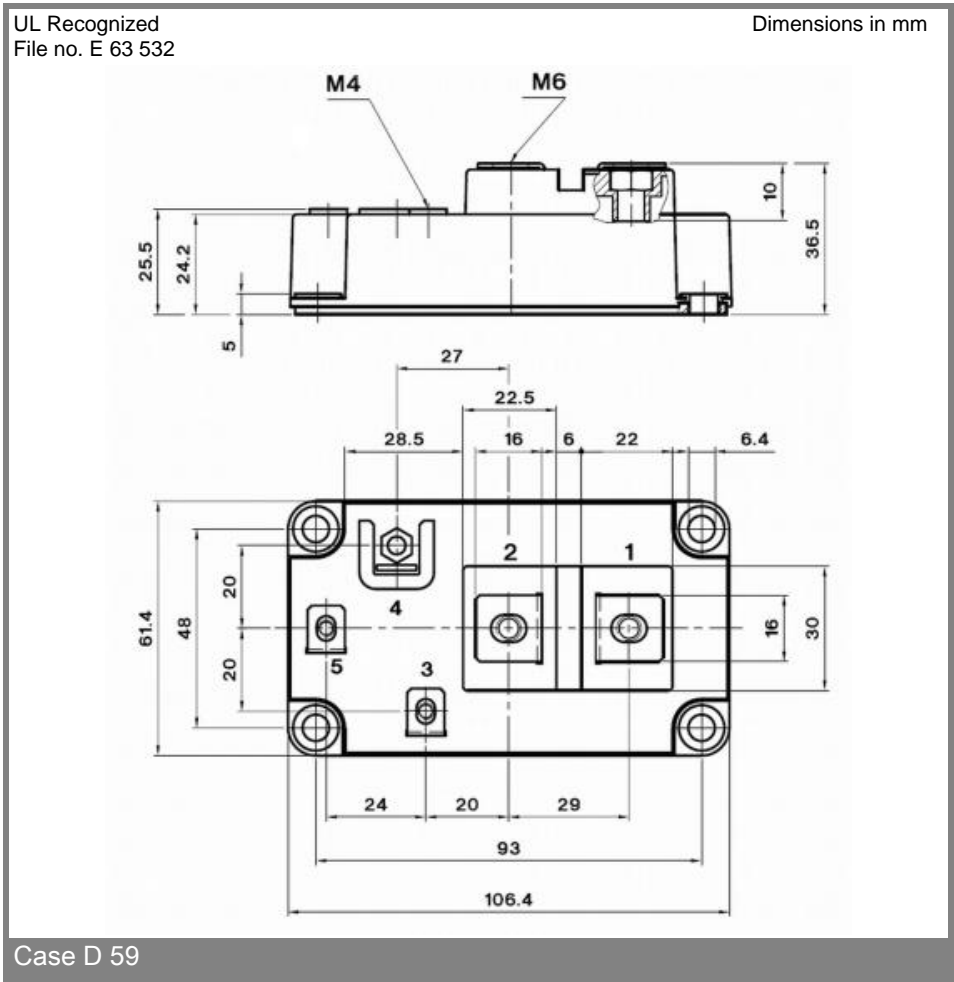
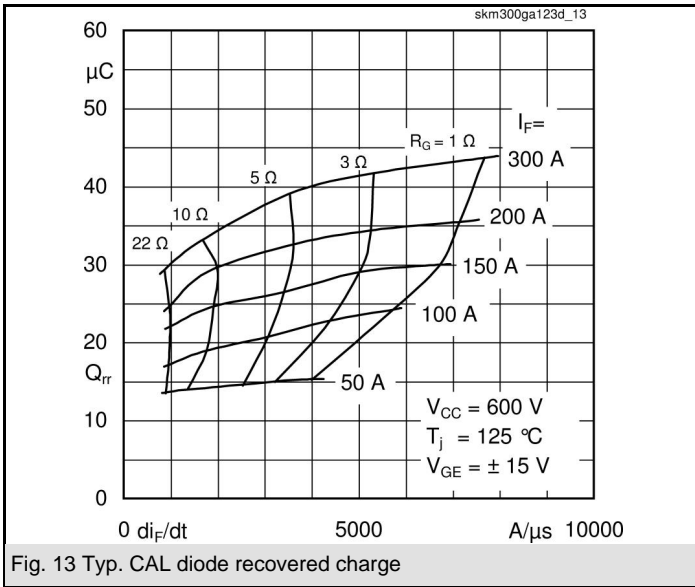
Absolute Maximum Ratings		$T_c = 25\text{ °C}$ , unless otherwise specified	
Symbol	Conditions	Values	Units
<b>IGBT</b>			
$V_{CES}$		1200	V
$I_C$	$T_c = 25\text{ (80) °C}$	300 (220)	A
$I_{CRM}$	$t_p = 1\text{ ms}$	400	A
$V_{GES}$		$\pm 20$	V
$T_{vj}$ ( $T_{stg}$ )	$T_{OPERATION} \leq T_{stg}$	- 40 ... + 150 (125)	°C
$V_{isol}$	AC, 1 min.	2500	V
<b>Inverse diode</b>			
$I_F$	$T_c = 25\text{ (80) °C}$	300 (200)	A
$I_{FRM}$	$t_p = 1\text{ ms}$	400	A
$I_{FSM}$	$t_p = 10\text{ ms}$ ; sin.; $T_j = 150\text{ °C}$	2200	A

Characteristics		$T_c = 25\text{ °C}$ , unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
<b>IGBT</b>					
$V_{GE(th)}$	$V_{GE} = V_{CE}$ ; $I_C = 8\text{ mA}$	4,5	5,5	6,5	V
$I_{CES}$	$V_{GE} = 0$ ; $V_{CE} = V_{CES}$ ; $T_j = 25\text{ (125) °C}$		0,1	0,3	mA
$V_{CE(TO)}$	$T_j = 25\text{ (125) °C}$		1,4 (1,6)	1,6 (1,8)	V
$r_{CE}$	$V_{GE} = 15\text{ V}$ ; $T_j = 25\text{ (125) °C}$		5,5 (7,5)	7 (9,5)	mΩ
$V_{CE(sat)}$	$I_{Cnom} = 200\text{ A}$ ; $V_{GE} = 15\text{ V}$ ; chip level		2,5 (3,1)	3 (3,7)	V
$C_{ies}$	under following conditions		15	19	nF
$C_{oes}$	$V_{GE} = 0$ ; $V_{CE} = 25\text{ V}$ ; $f = 1\text{ MHz}$		2	2,6	nF
$C_{res}$			1	1,3	nF
$L_{CE}$				20	nH
$R_{CC'+EE'}$	res.; terminal-chip $T_c = 25\text{ (125) °C}$		0,18 (0,22)		mΩ
$t_{d(on)}$	$V_{CC} = 600\text{ V}$ ; $I_{Cnom} = 200\text{ A}$		250	400	ns
$t_r$	$R_{Gon} = R_{Goff} = 4,7\text{ Ω}$ ; $T_j = 125\text{ °C}$		90	160	ns
$t_{d(off)}$	$V_{GE} = \pm 15\text{ V}$		550	700	ns
$t_f$			70	100	ns
$E_{on} (E_{off})$			26 (22)		mJ
<b>Inverse diode</b>					
$V_F = V_{EC}$	$I_{Fnom} = 200\text{ A}$ ; $V_{GE} = 0\text{ V}$ ; $T_j = 25\text{ (125) °C}$		2 (1,8)	2,5	V
$V_{(TO)}$	$T_j = 125\text{ ( ) °C}$			1,2	V
$r_T$	$T_j = 125\text{ ( ) °C}$		3	5,5	mΩ
$I_{RRM}$	$I_{Fnom} = 200\text{ A}$ ; $T_j = 25\text{ (125) °C}$		80 (120)		A
$Q_{rr}$	$di/dt = A/\mu s$		11 (29)		μC
$E_{rr}$	$V_{GE} = 0\text{ V}$				mJ
<b>Thermal characteristics</b>					
$R_{th(j-c)}$	per IGBT			0,075	K/W
$R_{th(j-c)D}$	per Inverse Diode			0,15	K/W
$R_{th(c-s)}$	per module			0,038	K/W
<b>Mechanical data</b>					
$M_s$	to heatsink M6		3	5	Nm
$M_t$	to terminals M6 (M4)		2,5 (1,1)	5 (2)	Nm
w				330	g





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This is an electrostatic discharge sensitive device (ESDS), international standard IEC 60747-1, Chapter IX.

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